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SOCIETY OF ARTS.

FRIDAY, AUGUST 26th, 1853.

NOTICE TO INSTITUTIONS.

THE Council have much pleasure in announcing that Thomas Sopwith, Esq., F.R.S., F.G.S., has placed at their disposal fifty copies of his "Lecture on Education;" fifty copies of a small tract "On Benefit Societies;" twenty copies of "A Tract on Friendly Societies, the *bona fide* production of four Miners in Allendale;" and ten copies of a pamphlet "On Mining Records;" for distribution to the Institutions in Union. As the number of these works is less than the number of Institutions in Union, it is requested that special applications may be made, which will be registered in the order of their receipt, and the books will be sent out in the next parcel.

SUBSTITUTE FOR GUTTA PERCHA.

THE short notice inserted in the Journal a few weeks since on this subject having attracted considerable attention, and caused many inquiries to be made, it is thought desirable to print the following article, extracted from the Journal of the Agricultural and Horticultural Society of India, recently received from Calcutta by this Society:

"On the Juice of the Muddar, as a Substitute for Gutta Percha.—Communicated by Capt. Meadows Taylor.

"MY DEAR SIR,—I observe in the last Number of the Society's Transactions that the Muddar, *Aselepis gigantea*, affords a very valuable kind of hemp or flax; and I have now the pleasure to communicate to you another valuable property it possesses, which has been lately discovered by a friend here, under whose permission I make the present communication to you.

"Dr. Riddell, the officiating superintending surgeon of the Nizam's army, had for some time been employed in extracting, or determining, by chemical experiments, the well-known medicinal properties of this plant, and during his investigations having had occasion to collect the milky juice or sap and expose it to the air, found, as it gradually dried, that it became tough and hard, and not unlike gutta percha. This induced him to treat the juice as that of the gutta percha tree is done, and the result has been the obtaining of a substance apparently precisely analogous to gutta percha, of which I have the pleasure to send you a specimen bearing the impression of his seal, marked No. 1. The mode of preparing this substance is as follows:—The juice or sap to be collected by incision. An open slit may be made in the back of the plant, and a pot tied to it, when it will flow into it; or it may be collected by cutting the back and catching as much as flows out at once. Dr. Riddell calculates that ten average-sized plants or bushes will yield as much juice as will make a pound of 'gutta percha' substance; but it is not known yet how far the plant will bear tapping without injury,

nor how often, or at what intervals, the extraction of juice might be made. The juice extracted may either be exposed to the sun in a shallow vessel, or left to dry in the shade: by the former process the substance becomes a little darker than by the latter. When it has attained a tough consistency, it may be well worked up in very hot water with a wooden kneader, or boiled; either process serves to remove an acrid property of the juice, as also all other matter but the 'gutta percha' itself. It is believed that the more it is boiled and worked up, the harder it will eventually become when cool.

"Comparison with the true gutta percha gives the following results:—Sulphuric acid chars it; nitric acid converts it into a yellow resinous substance; muriatic acid has very little effect on it; acetic acid has no effect; alcohol ditto; spirit of turpentine dissolves it into a viscid glue, which, when taken up between the finger and thumb, pressed together and then separated, shows numberless minute and separate threads.

"The above chemical tests correspond exactly with the established results of the real gutta percha.

"The substance, however hard it may have become, becomes immediately flexible in hot water, and readily takes any form required, receiving and retaining impressions of seals, ornaments, &c. It has been made into small cups and other vessels, which are not found to alter in form. A test I suggested myself was, would it unite with gutta percha? and this was satisfactorily proved in my presence. A piece of the real gutta percha, of similar size with a piece of the new substance, was softened in hot water, and united readily; a specimen of this mixture is sent, marked No. 2. The tests by acids on the mixed substance did not differ from those on either of the two original substances. As there is no trouble attending the manufacture, and as I have no doubt the plant may be had near Calcutta, I have not sent more than a small specimen of that prepared by Dr. Riddell; and have no doubt that you, if you consider the subject worthy of attention, which it strikes me it is in an eminent degree, can readily prepare some of the new substance for any further experiments, chemical or otherwise, which you may consider necessary. If the muddar could be profitably grown for its hemp alone, it is evident, if this new substance proves in practice what it now appears to be, that an acre of cultivation of it would produce a large quantity of juice, and thus materially enhance its value. The poorest land suffices for its growth, but I have no doubt that if cultivated and plentifully irrigated, not only would the yield of juice be larger, but the growth of the plant, and the fineness of its fibre when made into hemp, materially increased.

"Believe me, &c.,

"MEADOWS TAYLOR.

"Hyderabad, 2nd November, 1852."

SUBSTITUTE FOR GUTTA PERCHA.

(From the *Dombay Times* of November 4th, 1852.)

The following is a very interesting extract from a note from Dr. Riddell, containing an account of the experiments made by him on a substitute for gutta percha, which he believes he has discovered. The subject is most important, and if we can make a common hedge

plant yield a product so valuable, and the demand for which is so certain quickly to outrun supply, a material addition will have been made to the productive resources of the country :

"I have now the pleasure of sending you the results of my experiments on the juice of muddar, and which I think will be found to assimilate closely with all the properties of gutta percha. A nearly similar substance is procurable from the juice of the milk bush or hedge, as it is called, the *Euphorbia tirucalli*, only when it hardens after boiling it becomes brittle; whilst warm it is as ductile as the other and becomes hard quicker, without any of the peculiar scent of the *Asclepias gigantea* juice; it readily dissolves in spirits of turpentine, but is not affected in alcohol. As the juice is very acrid, and blisters the skin, giving most excruciating torture if the slightest particle gets into the eye, care must be taken in collecting it; however, a machine could easily be made for chopping up the boughs and expressing the juice, so that it need never be touched by the hands. The juice of that elegant plant of the same species, the *Poinsettia*, which has such a beautiful effect in the garden when the leaves turn scarlet, gives a similar substance, but does not harden when cool as the other, but still firm enough to be twisted, and would make a good varnish in a solvent like turpentine and then mixed with spirit. The plant grows readily from cuttings, but requires water, which the other two do not. As regards my experiments with the muddar juice, they are as follows:—Having collected about 18 fluid ounces, I had it strained through a cloth, and exposed 13½ ounces of it to solar evaporation on a flat dish. In three days it became firm, separating itself from the dish and easily removed. I then placed it in boiling water, and worked it well about with a spatula, and when cool enough to handle, kneaded it with my finger; when cool, I found it to weigh a little more than 6 ounces. I then boiled it, and, as it cooled, worked it well again; and on weighing the substance found it had lost 1 ounce. It was then pulled out into shreds and boiled a second time, kneading it whilst cooling, and 4 ounces 2 drachms apothecaries' weight was obtained of what I call muddar gutta percha. The next experiment was with 4 ounces of the juice, which weighed 4 ounces apothecaries' weight; placing it in a basin, I poured about one quart of boiling water on it, stirring it up and then leaving it to stand, when it broke into curds and fell to the bottom. I then partially poured off the fluid, and filtered the residue through paper, and on its being sufficiently dry to be removed, found it to weigh 1 ounce 6 drachms. It was then worked well in hot water two or three times, and formed into a mass which gave 6 drachms, thus losing 1 ounce. On the whole, it will be seen that the most economical method of preparing the juice, is by solar evaporation, the residue being nearly double to that of the second experiment.

"Result of the experiments in acids, alcohol, liquor-potassæ, and spirits of turpentine, on equal quantities of the muddar, made into small pellets, immersed forty-eight hours :

"Sulphuric acid.—Much charred, particularly outside. Cut a pellet in half, found the inside spotted, not charred, throughout; the remaining part stretching like tough dough.

"Nitric Acid.—Appeared converted into a yellow resinous substance, and gained about one-third in weight, which it lost again when dry; found it pliable under pressure of the finger. When mixed with water, it coloured it yellow.

"Muriatic acid.—Coloured somewhat like the sulphuric, but not so black; soft and plastic; no increase in weight; colour, brownish outside, with a reddish tinge inside.

"Acetic acid.—No diminution in weight whatever; apparently the same as when first immersed.

"Alcohol.—The substance apparently softened, and lost a trifle in weight; spirit slightly discoloured.

"Liquor potassæ.—Washed it in warm water, and let it dry; has a yellowish tinge; increased a little in weight, but become very ductile and adhesive.

"Spirits of Turpentine.—Placed one part in four of turpentine, and in twelve hours it was quite dissolved, forming a thick creamy substance, which, mixed with spirits of wine, would make a good varnish for silk or cloth.

"R. RIDDELL."

HOME CORRESPONDENCE.

PATENTS.

LETTER II.

SIR,—Last week I dealt with that primary argument in defence of patents which asserts or assumes that inventors have a natural or moral right to the intervention of the law to prevent anybody else from using the same invention for fourteen years. A still bolder form of the same argument, which the more indiscreet advocates of patents have sometimes put forward is, that the poor man who invents a thing out of which he may be able to make a fortune if he is granted a monopoly of it, has just as much *property* in it, and just the same claim to have that property secured to him by law, as a rich man has in the property which he has either received by bequest or made by his own exertions.

No doubt that mode of talking is extremely well calculated to obtain the assent and applause of the ignorant and uneducated, who are always too ready to listen to any preacher of the doctrine, that those who have got a larger share of the good things of this world than themselves have really no more right to it than they have. And accordingly I have no doubt, indeed, I know, that the law of patents is most popular with the lowest class of inventors, who can hardly be expected to take a very comprehensive or far-sighted view of the effects of any law, and also naturally enough fancy that they see in the patent system a chance of some day leaping into opulence by hitting upon an invention which will make their fortune; just as the very same class of men, with equal foresight and equal profit from experience, are always ready, under other circumstances, to combine for the purpose of resisting and exterminating any invention of which they fancy the effect will be to interfere with their own labour and immediate profits. In fact, patent laws are just as popular with this class as everything in the nature of a lottery has always been, and for very much the same reason; viz., that they offer them a chance, and a chance of about the same value as a lottery, of making a fortune by a lucky hit instead of by the toilsome and commonplace method of working for it; and this notwithstanding they know perfectly well, for they cannot look round them without seeing it, that for one man who raises himself from a low condition in life to a high one by a successful patent, hundreds do so by using their wits in minding their business, to say nothing of the other hundreds who have boasted what property they had by speculating in the patent lottery.

Plausible, therefore, and captivating as it may be to those whose education and experience does not qualify

them to judge in many things what is even most for their own advantage in the long run, I should think that to any educated person the bare statement of such a proposition as the identity of property already realized with something by which property may be realized if the author of it is granted a monopoly, is equivalent to refuting it.

But I said also, it was a very indiscreet argument for the patent advocates to put forward; and I say so, because it at once invites this obvious answer—Very well; you demand that inventions shall be protected by the law as property is: so they shall be; all other property is protected by law in this way, and in this only, that the owner of it is allowed to do as he pleases with it; he may make it as profitable as he can or as unprofitable as he likes, but he is not allowed to interfere with anybody else doing what they like with theirs, and you may do the same with the invention which is your property. The opponents of the patent laws can desire nothing better than to see the defence of them rested on such grounds as these.

It is another common fallacy to represent the question of patents or no patents as one between the poor man, who invents without the capital to manufacture his inventions, and the rich man, who has the capital, and who would use the invention without paying for it, if there were no patents. This again, I suspect, is nothing but a device of the advocates of patents to get support on plausible and popular grounds, which they know have really nothing to do with the question. For, so far from patents making rich capitalists pay for what they would otherwise get for nothing, they evidently enable the manufacturer who buys the patent of the inventor to get larger profits by means of the monopoly than he could get without it. Undoubtedly he does pay for it in the first instance; but then the public, who buy the article when manufactured, have ultimately to repay the price so paid to the inventor, and as much more besides as the manufacturer finds he can sell the thing for with the help of his monopoly. Indeed, it is remarkable enough, that while the patent advocates are exclaiming, that if it were not for the protection of patents the rich manufacturers (whom, by the way, they generally assume to be incapable of inventing anything for themselves) would have an undue advantage from the inventions of other people, they are, on the other hand, always complaining that under the patent laws (or notwithstanding them, if they like it better), the capitalists do now get far the largest share of the profits, which, they say, ought to belong to the patentee. I dare say the ingenious reader has already on his lips the answer, that that is no reason why they should get the whole of the profits. But that answer will not do, for this very simple reason—that if there were no patents, there would be no profits arising from patents. There would be profits, of course, arising from the improved mode of manufacturing; but, inasmuch as every manufacturer could use the improvement if the monopoly were abolished, they would soon be reduced by competition to the ordinary level of the profits of the business, instead of being kept up for the benefit of the proprietor of the patent for the fourteen years of its duration, or until it is superseded by something better.

We may as well, therefore, dismiss the "rich capitalist" from the scene, seeing that his presence does not the least help to elucidate the inquiry; and that, so far as his intervention affects the case at all, it is exactly in the opposite direction to that which the advocates of the protection of inventions wish us to believe, patents being really much more of a "protection" to the capitalist

who deals in them against the public, than a security to the inventor against the manufacturer; and the poorer the inventor, of course the less chance he has of making a good bargain for himself in selling his patent to the purchaser of it. But I am quite willing to deal with the question of the right of inventors to protection, as if every patent remained in the hands of the patentee himself, granting licenses under a royalty to everybody who chose to take them; and, consequently, as if there were no rich capitalists intervening between the inventor and the public to aggravate the effects of the monopoly: and this is evidently the most favourable way in which the case can be put for the "friends of the patentee." But although this is the favourable case for them, inasmuch as the tax upon the public for patented inventions would probably be much less under those circumstances, and we should have the satisfaction of knowing that it was levied for the benefit of the inventor, and not of the man who has bought him up, still it leaves the radical objections to the system untouched, and does nothing towards settling the fundamental question whether it is just, reasonable, or expedient, that one inventor of a thing should be allowed to stop everybody else from using it, who either has or might have invented it for himself, or who has discovered something else by which it has acquired a value far beyond what the patent-protected inventor was able to give it.

It is very easy to appeal to the names of Watt, Arkwright, Wheatstone, and a few other well-known names, and say, that if there had been no patents, these men, who have undoubtedly conferred great benefits on mankind, would probably have made nothing, or very much less by their inventions. But this argument is hardly less superficial and imperfect than the others. For unless you can prove on general grounds that all inventors are entitled, or ought to be allowed, to prevent everybody else from using the same invention, in order that they may have a chance of making their fortune, the fact that a few inventors have made their fortune by patents, clearly will not help the argument in favour of them. Every man who put into a lottery had a chance of making a large sum of money by it; lawyers had a chance of becoming Masters in Chancery; clergymen with 70*l.* a year, and seven children, were encouraged with the chance of what Sydney Smith called, "the great prizes in the Church." But lotteries were abolished because they are mischievous; Masters in Chancery are to be no more, because their work can all be done by the Judges under improved arrangements; "the great prizes" are so reduced in number and value, and small clergymen with large families so much increased in number, that the chance of each one of them ever getting a comfortable income, is enormously less than it was twenty years ago. And so inventors may depend upon it, that unless they can convince the public that patents ought to be kept up on general grounds of either justice or expediency, they will not be kept up in order that every one of the thousands of patentees in a year may have a chance, such as it is, of making his fortune, because Watt and Arkwright did.

Many persons seem to think that the question between patentees and the public is merely whether a newly invented article shall be sold for a little more, in order to give the inventor some reward for inventing it, or for a little less, in order that the public may have it without rewarding the inventor at all. But it is no such thing. If it were, there would, perhaps, be no more objection to patents than to copyrights. Probably books are dearer on account of copyright, but the public willingly acquiesce in that, because granting an author the ex-

clusive right of publishing his own works, in many cases is the obvious, and the only possible mode by which he can be paid for his labour in writing them. And here we may notice another distinction between the monopoly of authors and the monopoly of inventors, besides those I pointed out before, viz., that copyright only enables an author to be paid for his actual work; and probably there is no labour worse remunerated, on the whole, in proportion to the talents required for it, than literary labour; whereas an inventor with a patent claims to be paid, not for his work, but for his ideas; and in order that he may be so paid, he demands that all future or contemporaneous inventors shall be stopped from using the same idea, although it may be equally their own, or from improving upon it (except by a deviation sufficiently wide to evade the patent), or from applying it to purposes of which the inventor himself had no idea when he got his patent, and was, perhaps, altogether incapable of contemplating or comprehending.

And it is yet further to be remarked, that, notwithstanding the existence of copyright, it does not reserve to the author the exclusive use of the ideas he may publish, but only of the words in which he has expressed them. Sir Isaac Newton, or Leibnitz, could not have had a patent for the differential calculus, nor Napier for the invention of logarithms; and yet, by discoveries and suggestions of this kind, and by multitudes of others which are every day given to the world in books, the powers of mankind are as much enlarged, and as much labour is saved, as by nearly any invention which has ever been protected by a patent: nay, if these very inventions of a literary kind which I have just mentioned had been for working calculations by wheels, and levers, and indexes, they could have been patented; but because they are for calculating only by pens, ink, and paper, they could not. Last week I showed that the defence of patents on the ground of their analogy to copyright fails, because copyright does not do what is the essence of patent right, viz., prevent other authors from writing everything they could have written if there had been no previous book on the subject, and does not obstruct the progress of literary science, but just the contrary; inasmuch as every book worth anything is an assistance and not an impediment to every subsequent writer on the same subject, and an addition to the literary property of the world. And now I have shown that on the further examination of this analogy between copyright and patents, it appears that the principles on which copyright is founded, and the effects of its operation, are not only no reason for, but are a strong reason against, the very different kind of protection which is conferred by a patent.

It is not unworthy of notice, too, that although the proportion of patentees who make any large sum of money to those who make none and lose a great deal is very small, that of authors who make a fortune by literature is far smaller; and not only that, but the only class of books by which a man has any chance of making a fortune, or even a good income for his life, are those which contribute least to the information but most to the amusement of mankind. And even such an income as the most successful author can make by writing books is only made (with exceptions as rare as Sir Walter Scott's are) by men who devote themselves entirely to that work; whereas the most profitable inventions are made by men who are all the time making their living by their business. In short, inventing is never the regular occupation of any man's time, except, perhaps, a few of that proverbially unsuccessful and unfortunate class of men, who are more properly to be called schemers than in-

ventors, and who, as I said last week, have not the smallest claim to be compensated for the time they waste in making ignorant and unsuccessful attempts, and, according to the common phrase, beating about the bush instead of getting into it.

I have really been anxious to find out something else which would present even a *prima facie* resemblance to the case of a patentee being allowed not only to tax, but to interfere with, the public, in order to enable him to receive a large sum of money for a single act, by which, if you like, the public is very much benefited, as distinguished from the usual occurrence of a man's being paid only for the work which he does from day to day; but no such instance occurs to me. There is obviously no analogy between making a large sum of money by the monopoly of an invention and making it by a single clever or lucky venture in trade or speculation; and even if there were, the trader or speculator at any rate does not do it by virtue of any protection or monopoly given him by a law made expressly for his benefit. Naval and military commanders are sometimes granted a fortune by Parliament for services rendered to the nation in a single great battle. But if anybody is inclined to compare the winning of an important battle with the giving to the world an important invention—and I do mean to say the comparison is an unfair one—still there is this striking difference between the rewards; that one is given voluntarily by the nation, and after the service has been fully performed, of which they can appreciate the value, and moreover, it is only a grant of a definite sum of money; whereas the reward given to the inventor is the *a priori* grant of a privilege, which may or may not enable him to make money, but which does certainly, whether the invention turns out of any real value to the public or not, enable him to interfere with other people who are not indebted to him at all, and to obstruct the progress of invention and science.

The proper parallel to the granting of rewards by Parliament to Generals who have performed great services for the nation, would be the granting of rewards by Parliament to inventors who have conferred great benefits on mankind; as, in fact, has been done in several cases which occur to me at once,—such as to Dr. Jenner, for the discovery of vaccination, and to some other medical discoverers; and also to several inventors of improvements in chronometers, under the Act for encouraging inventions for ascertaining longitude at sea. This is a very different thing from patents, and a thing to which I see no objection at all, provided, of course, proper precautions are taken to ascertain the value and originality of the invention to be rewarded. And the latter of these conditions, viz., the originality of the invention, is notoriously not secured by the patent laws at all. It may be perfectly clear to everybody, even to a Jury, that the idea and principle of the invention was suggested to the inventor by somebody else; and yet the patent may be perfectly good, inasmuch as it is a well known rule of law that a patent cannot be taken out for a principle. Thus, Kyan discovered the principle of preserving wood from dry rot, by saturating it with something that would destroy its vitality; and invented some stuff for the purpose. Then comes Sir W. Burnett, and obviously proceeding on the principle suggested by Kyan, finds out and patents some other stuff which produces the same effect at less cost; and to a great extent, I believe, superseded and supplanted Kyan, whom nobody can doubt to have been the really meritorious inventor. And cases of this kind occur, and must occur continually, under any system of protecting inventors by monopolies.

I think I have now sufficiently disposed of all the arguments which are usually put forward for the purpose of defending the monopoly of the patent laws, on any principle of right or justice to inventors. And therefore in my next letter I will consider the more moderate claims of those who think that it is on the whole *expedient* that inventors should be encouraged by the prospect of this kind of reward, even though they may be admitted to have no *right* to call on the public to concede it to them as a privilege. I will not, however, wait till next week to say that, although I believe this mode of rewarding inventors to be wrong, I entirely concur with those who think that scientific men ought to receive a great deal more direct encouragement and support from the nation than they do; and I have no doubt that the popular and very mistaken notion, that they may be sufficiently rewarded by getting patents for their inventions, is one of the reasons why purely scientific men are probably worse rewarded for what they do for the benefit of mankind than any other class of men whatever.

Yours faithfully,
E. B. DENISON.

Ben Rhydding, Leeds, 22nd August, 1853.

SIR,—Mr. Denison may dislike any touching of his shield by an opponent without a cognizance, but inasmuch as he volunteered the throwing down his gauntlet to all and sundry, he cannot claim exemption on the score of his nobility, from the random blows of ruder antagonists in the *melée*. The truth will prevail, whether backed by the arguments of Mr. Denison or the anonymous "Cosmos." Their value depends not on the name, as Mr. Denison would have us believe.

However, I am thankful to have the benefit of Mr. Denison's arguments, even though unfortunately "he has no books to refer to" in confirmation, and am content to share the obloquy he heaps upon an anonymous correspondent.

Mr. Denison's assumption that inventors claim a "natural right" is simply an invention of his own or of lawmen before him, and not to be found in the inventor's brief, and which must not be palmed or foisted on them by the plausibility of adverse counsel. The term "natural right" is an absurdity. Nature is the law of God. Rights are rules, or things ruled by man, and sometimes ruled very crookedly when ruled by ignorant and selfish human power. Men claim rights in the streams, in the fisheries, in the land (as Mr. Denison will find it expressed in some of the old charters, with "white wax bitten with the tooth" by way of seal), "as high as heaven, as low as hell." Man has claimed right to the seas, and would have done to the air, could he have found out how to mark boundaries thereon, and take possession of the property. He did his best in the phrase "high as heaven," and left it on parchment records as evidence of his impotent will. Mr. Denison must know very well that no decently educated or clear-brained inventor, ever held the doctrine of "natural right," and states clearly enough the real origin, after failing to throw dust in the eyes of the jury by false imputations—

"He makes the giants first, and then he kills them."

"First let us consider this 'natural right' view of the case, of which we may remark by the way, that patents for inventions were not originally established on any such ground, but were a relic saved from that system of granting monopolies for the use of everything, which had become one of the national grievances two or three hundred years ago."

Precisely so; after the raw material of the land had

been all embargoed and sold and the money spent, the descendants of those who took the land, *vi et armis*, seized the usufruct, and made all sorts of people pay them fines and quit rents for permission to turn it to account. In this mode the raw material was turned to account many times over, in proportion as working brains increased its value.

All these processes, not of "natural right," but of much particular wrong were upon the whole a great good to society, for without them, neither society nor arts, could have arisen. They are the rude processes of nature, by which the institution of "property" was worked out. And all property is a monopoly—it is something held by one person or set of persons independently of others. And it is the desire of this monopoly which induces people to work, and to accumulate, at least in the present condition of mankind. The monopoly of property was gained by strength, by might, by power, which perpetuated it in hereditary descent. And upon the whole, the strength and might and power were serviceable to mankind; whether the hereditary descent has been so, has often been disputed. The practice of granting patent monopolies for improvement useful to mankind is also hereditary, but it must be accompanied either by service or the appearance of service as often as the grant takes place; whereas the Insolvent Court constantly holds up to our view numerous examples of entailed estates, the owners of which never rendered any service whatever to mankind, but quite otherwise.

We have now got to the "admission"—a very difficult thing for a lawyer to come to—that a patent is a monopoly, as well as a private estate in land or other material things. But Mr. Denison will say, "a patent is a right conferred upon one individual by taking away a right, or rather an equitable claim, from many other individuals." And I answer, that an estate in land is a right conferred on one individual by granting the equitable claims of many other individuals, and merging them in the thing called Poor-law. Neither of these monopolies are justifiable upon any other principle, any more than the monopoly of the throne of England by a particular family, save that of an enlarged amount of benefit to the general community. And supposing them both to be unmitigated evils, the monopoly of the landed estate is infinitely the worst evil, because the law has done its best to make it perpetual in a family; whereas the patent monopoly expires in fourteen years, at furthest, from its date. The world, as it exists, is made up of monopolies; and so long as those monopolies represent human energies, they are beneficial things to society. When they cease to represent energy, and become the effete depositories of by-gone power, they are shams and mischiefs, and should be swept into Hades. The throne is a monopoly, from the presumed advantage of getting rid of all disputes of succession. The House of Lords is a monopoly by a senate of elders who revise the laws, and sometimes originate them, with provisions for a constant infusion of acute legal intellect. The House of Commons is a monopoly, for seven years, of the power of law-making. If not a class property, it is the property of the wealthy classes holding real property, and tending to preserve the useful institution of property. The judgment-seats are a monopoly of lawyers, and the magistrates' benches also, over which landed proprietors have reserved the monopoly to themselves; but an unjust judgment produces such an outcry, as to warn them that their monopoly is only held as a consequence of their presumed capacity and integrity.

Merchants of large capital are monopolists, and buy up all kinds of useful commodities to enhance their price and make a profit. Shallow people call them monopolists as a term of reproach. Yet without them there would be no large markets, and in time of dearth they are the instruments that by raising prices induce economy in consumers, and make the food or other commodities hold out.

Cotton lords are monopolists; but by their processes, they have made cotton cloth so plentiful, that they could clothe the whole globe with it as with a garment, were it desirable.

Railway contractors are monopolists, as witness their huge fortunes; but let no one grudge them who can appreciate how widely they have been benefactors to their fellows.

Foremen in factories are monopolists by dint of their business aptitudes; and, like other monopolists, they are sometimes tyrants.

But in all these cases, energy, more or less applied to the general benefit of the community, is the reason why such monopolies are sanctioned.

The other monopolies are of the raw material,—land, mines, forests, rivers, fisheries, harbours. These may be held without any other claim than *vis inertiae* and hereditary law, without any service whatever to the community. Yet still they are sanctioned, from the perception, or supposition, that a man's energies would very much slacken, if he expected that the estate he had purchased by his labour would be taken by law from his children without compensation.

The same reason that prompts the community to make laws giving monopolies to the small body of people above enumerated for unlimited or limited terms, viz., value received, also prompts the community to give monopoly to inventors for a limited term, viz., value received. The highest kind of invention that will effect a great reduction of human drudgery, can scarcely be too highly paid, in giving the inventor the control of a large amount of the savings he has realised, by an original application of some principle of nature turned to the service of humanity. It is probable that no one will invent new mechanical powers separately considered, though new contributions may be widely used; but it is very probable that moral natural agencies may be used in the application of those powers. He who accomplishes the conquest of such an agency, and turns it to man's use, will derive a tribute from his fellows, and ought to reap his reward in cash and repute. So also he who first points out an ignorance, and a waste in national labour, and the mode of remedying it, is a public benefactor.

But the discoveries of new natural agencies to supply the place of labour will be probably few. Heat in some one of its Protean forms may be better than in the others, but a monopoly of natural agencies is impossible. A new discovery will not rob mankind of the use of the old knowledge. And in new applications of old science, small indeed is the monopoly. When the public has a choice of twelve modes of old plans, it can well afford to wait till the new patent has run out, if it thinks the inventor hard in his terms.

The advantage the public gains by the patent is this—the inventor produces an improved mode of making cotton or flax or wool into cloth, stimulated to do so wholly by the profit and repute which may elevate him in the scale of society. He asks a large royalty, and gets a small profit, or a small royalty and gets a large profit; and in either case the result is to bring forth a crowd of new inventors, and perhaps patentees, to

whom he has shown the way, and the public has the benefit of immediate competition. But for the individual working at the invention with a desire of monopoly in order to make himself a capitalist, the improvement would not be produced, any more than Acts of Parliament would be produced other than by an individual working at them for the sake of acquiring a name, and with a name reputation and power.

Mr. Denison says it is unjust, because another man might have invented it next day. By the same reasoning it is unjust to let a Member of Parliament make an Act badly, when perhaps Mr. Denison or some of his friends might make it much better; but the inferior man gets the preference because he has had industry, or energy, or power of some kind to force himself into the position.

Mr. Denison is particularly unfortunate in his reference to Mr. Watt, in the following paragraph as a proof, that patentees stop improvements:

"He (Cosmos) then proceeded to expound himself, historically and philosophically, beginning somewhere about the time of Tubal Cain, and introducing an episode about James Watt and the steam engine, but forgetting that much more material and awkward fact for his argument, that if Watt had not also been lucky enough to hit upon the clumsy expedient of the sun-and-planet-wheel motion, for the purpose of evading a patent which had just before snapped up the monopoly of the crank, he would not have been able to make steam-engines of any use without first satisfying the exorbitant demands of the monopolist of the crank; and these demands, be it remembered, would be proportioned not to the value of the crank at the time it was invented, but to the new value that it acquired by Watt's own invention."

It so happens that Mr. Watt, in his specification, describes five different methods of communicating circular motion, including the crank and sun-and-planet wheels, thus proving that his inventive faculties were quite equal to the task of keeping him independent of the invention of the crank.

It certainly is not to the credit of an amateur rival of Louis XVI. in locks, the originality of whose invention has been questioned, to speak irreverently of the productions of a man of such philosophic and inventive powers as Mr. Watt. Of the movement in question—the sun-and-planet wheels, which Mr. Denison calls a clumsy expedient, a writer of high repute says:

"One of these [movements] was a beautiful contrivance of one wheel revolving in an orbit round another, and they were called the sun-and-planet wheels, from the resemblance to the motion of those luminaries."

Thus the invention of the crank, pirated from Mr. Watt, did not subvert the purpose of the pirate, but actually caused the invention of four other methods, and doubtless would have brought forth others if needful.

I can rejoice with Mr. Denison in the cheapening of patents, but I cannot rejoice with the legal profession generally in the wide scope of litigation still left to strip the patentee of his earnings.

Mr. Denison rejoices in the prospect of patents, by reason of their cheapness, becoming "inconveniently numerous." The matter answers itself. If they be useless no one will covet them; if useful, they ought to be used, or equivalents invented for them. It must be a miserable nature that would refuse to use a beneficial thing in order to keep the inventor out of profit. It is scarcely credible, or if credible it is not creditable, that a man in high position should seek to destroy the reputation and advantages of skill in other men. To describe an engineer in chief as fearing the progress of inventions, the very instruments by which he should work, is certainly not flattering, and might well elicit the remark, "Save me from my friends."

Mr. Denison's quotation from the "Famous Judge," "hard cases make bad law;" may with more truth be reversed, "*bad law makes hard cases.*" There was a

time when hard judges considered it a triumph to overthrow a patent; and their vicious reacted and has been the cause of saving some vicious patents, through sympathy with a beneficial class of men.

Here is another previous expression of opinion by Mr. Denison:

"I said the majority of inventions are made without any great expenditure of time or money. It is notorious that not a few of the most important have been made by accident; some even by mistake. There is a physician from America now making his fortune in London by a discovery of a specific for a large and fatal class of diseases, which he made by a mistake, having accidentally applied one thing instead of another to a case of that disease. Nobody of course can grudge him the fortune he makes, because he is benefiting mankind as well as himself; and yet nobody can say that he has earned it by the expenditure of time, money, thought, or science, in arriving at the discovery."

Nobody can grudge him his reward, yet no one can say he has earned it. No, nor can any one say that the men *earned* the monster gold nugget, getting 8,000*l.* by two days' labour. No one can say that a man *earns* his money by buying and selling in the funds; and yet no one grudges the profit to the dealer in stock. If all the world could have used the American specific, it is probable the physician would not have been able to make a profit by devoting his time to it. If I understand rightly, he has some means of keeping the advantage to himself, and so the thing becomes patent and advertised to all the world. Individual interest is a general profit.

Why are boys at school put in classes, and made to take precedence of one another? Because their faculties are thereby sharpened, and they are rewarded for their quickness of response. So in the great world, the quick and intelligent men are put ahead of the others. People desire to get fortunes, and they sit and gamble and horserace. It is a property in human nature to speculate. It is the very basis of all commerce; and no speculation can be more beneficial than that of invention for the diminution of drudgery.

The last paragraph winds up with Mr. Denison's belief:

"And therefore, although it may seem a startling proposition, I go at once to the bottom of the claim for protection of inventors, on the ground that they may have spent a great deal of time and money in arriving at their invention, by denying that that is a ground for the interference of the law on their behalf: in other words, I deny the natural or moral right of an inventor to stop the inventions, or the improvements, or the works of other people, in order that he may have the opportunity of making a large fortune by the result of a single piece of skill,—a single new application of science, perhaps a very slight step in advance of what has been done before; perhaps no advance at all; a single piece of lucky observation, accident, or mistake; or even the result of a long course of unprofitable and unsuccessful experiments, at last ending in the right one."

Substitute the word *land* for *inventions*, and the venue will all be changed. "I deny the natural or moral right of a land-owner to stop the possessor or cultivator in improvements of other people, in order that he may make a large fortune by rent, because his ancestors were lucky enough to come over with William the Conqueror, when he has done nothing beyond what the Saxon boors did before him; when he is only the result of a single lucky accident at his birth; and the multiplied profits of his estate have been brought about by a system of instruments, and draining, and cultivation, worked out by mechanical and chemical inventions."

To conclude: inventors understand that, in default of capital, their brains are the ladder by which they can ascend in social position; and the body who form jurors will take care that this wholesome state of affairs—the lower structure rolling up to the higher, as an essential condition of public safety—no "judgmatic law" shall break down.

The hackneyed phrase of monopoly should be well

expounded. To excel is not to monopolise; to hold and possess without excelling is monopoly.

Aug. 22nd, 1853. I am, Sir, yours,
COSMOS.

LIST OF LECTURERS AND THEIR SUBJECTS.

Institution, Aug. 22, 1853.

SIR,—Your List of Lecturers is on many accounts a very important document, and will be very useful to the Institutions; but how much more important and more useful it would have been if the materials of which it is composed had been contributed by the whole number of Institutions in Union, instead of by only 66 out of 285! There are 148 names on the list of lecturers; and of these 95 are proposed by not more than one Institution. If, therefore, the whole 285 Institutions had filled up and returned your schedules, it is probable that we should have had twice or thrice the number of lecturers named, and that a very large proportion of them would have been gentlemen not generally known to the Institutions.

It is much to be lamented that the Society of Arts is not properly supported by the Institutes in Union. I felt ashamed when I saw that only 66 Institutes out of 285 had taken the trouble to reply to your circular of the 28th July. Your Society cannot help us if we will not stir a finger to help ourselves.

Yours obediently,

To the Editor.

A WORKING MAN.

SIR,—I was much pleased with the "List of Lecturers and their Subjects," which I received from the Society of Arts on Saturday. I am convinced that the collection and publication of such a list will materially aid the Committees of Institutions in their selection of Lecturers, and that the recommendations coming from the Institutions themselves will relieve the Council of the Society of Arts from any suspicion that might otherwise have arisen, of favouritism towards those Lecturers whose names were put forth by the Society.

My principal object, however, in troubling you, was to express my disappointment that only 66 out of 285 Institutions should have made returns to the Society's circular. This is to me a convincing proof that the Institutions in Union do not understand the great importance of a central office, as now supplied by the Society of Arts, for collecting facts and opinions from individual Institutions, and digesting, arranging, and re-issuing them in a convenient form for the use of Institutions in general. This listlessness will not last long; but every week is of importance, and I trust that these few lines, even, may rouse a few Committees from their apathy. In Institutional, as in all other matters, all knowledge, or the means of it, exists in some shape somewhere. It is organization alone that is wanted to make it available. In the early stages of civilization, knowledge passes direct from man to man; but when literature and science have attained to any importance, society is taught less by individuals than by the condensed knowledge of the many.

The Society of Institutions is certainly at present in the early stage of civilization, but that era may soon be passed if Committees and Secretaries will but study the importance of organization for general information, and avail themselves of such opportunities as the Union with the Society of Arts affords.

I perceive that several Lecturers advertise in your columns. Will you permit me to suggest that, for the

convenience of Institutions, all such advertisements should be collected together, and headed by the word LECTURES.

A CHAIRMAN.

SHIP BUILDING.

SIR,—I do not know whether the Society of Arts has or has not offered any premium for improvements in the art of Ship Building,—but if no such premium has been offered, I would respectfully suggest that some special Prizes should be offered, as well for a Treatise on the present most approved and novel systems of naval construction, as for any new modes of constructions; with especial reference in both cases to the sailing qualifications of clippers and yachts. When we find that English shipowners and merchants are giving orders for vessels to American ship-builders, I think it is high time for us to bestir ourselves, and to endeavour by all possible energy to maintain the hitherto high fame of Englishmen in this most necessary art. In my humble opinion, the Society of Arts, by offering adequate prizes for these subjects, may elicit many useful suggestions, and perhaps some novel systems of practical utility. At any rate, a Treatise on the art as practised here and in the United States, with illustrations of such vessels as the *Sovereign of the Seas*, etc., could not but be useful. And here permit me to say, that to my thinking, the Society of Arts would find it more conducive to the objects it has in view, to offer fewer but more adequate prizes. I think, that if the Society were to take a more limited range, confining the prizes, or the larger ones, to some important subject, that more beneficial results would accrue than from the present system of giving a mere medal for every imaginable want throughout the circle of art.

I am, Sir, your obedient Servant,

A MEMBER.

IMPROVED OCEAN NAVIGATION.

A numerous meeting of merchants, ship-owners, captains, and others interested in navigation, was held on Thursday week, at Lloyd's, to receive from Lieut. Maury, of the United States' Navy, Superintendent of the National Observatory at Washington, explanations of the system adopted by the government of his own country for collecting and disseminating information relative to the direction and force of winds and ocean currents in all parts of the world, and meteorological observations.

Lieut. Maury said, that having taken a chart of the North Atlantic Ocean, he collected together all the men-of-war tracks that he could get hold of, and projected them on the chart in such a way as to show the method, direction, and force of the winds daily encountered by each vessel. Having done that, he was very much surprised to find that there was in the middle of the Atlantic what might be termed a blank space—a *terra incognita*;—a space in the ocean, lying between the outward bound vessels going to the southern hemisphere, and that of homeward bound vessels returning from it. On examining the matter further, he found it to be the impression of many navigators that, in order to get to the Equator from America, they must cross the Atlantic three times.

He recommended the middle, or new route; and the first vessel that had the courage to take it—the *W. H. C. Wright*, of Baltimore, Jackson, master—made the passage in twenty-four days, instead of forty-one days, which was the average by the old route. This fact enabled Lieut. Maury to enlist the voluntary co-operation

of ship-masters, who furnished him with an abstract log of the daily position of the ship, of the prevailing direction of the wind, of the height of the barometer, of the state of the thermometer, and any remarks which might have occurred to them to make touching the winds and the waves, and the general course of navigation. He then began to co-ordinate the results, so that every one might be able to see in each month of the year what was the prevailing direction and character of the winds, and so be enabled to take advantage of regions in which the wind was favourable, and to avoid those in which they were unfavourable. Another system of investigation was then commenced, in which the ocean was divided into spaces of five degrees, and the results co-ordinated from the log-books were recorded thereon. These charts were furnished to American ship-masters (and it was desired to place British ship-masters on the same footing), on condition that they should enter into an engagement to keep and furnish to the government an abstract log, according to a certain form, containing the points of observation already referred to. It was peculiarly desirable that navigators should have some information as to the winds and currents in the Indian and Pacific Oceans; and he was thoroughly satisfied that the average passage hence to Australia might, by means of this system of investigation, be materially shortened, and reduced to something like certainty, even under canvas. Already the *Marco Polo* had made the passage in seventy days by adopting this system.

In dealing with the winds and currents, it occurred to Lieut. Maury to investigate some other matters connected with the industrial pursuits of the sea. He requested the American whaling-masters to furnish him with their journals. With these, and the map of the ocean divided into squares of five degrees each, he could tell how many days in each month of the year vessels spent in any particular part of the ocean looking for whales; how many days they had seen sperm whales, and how many they had seen right whales; by which means he had been able to see very clearly what parts of the ocean were most frequented by whales, and what parts of it, at various periods of the year, afforded the best hunting-grounds. It turned out that there was a belt of 2,500 miles in breadth, going right round the world, in which the right whale was never seen. The right whale could never cross the tropics; and, in the opinion of a whaler, who had been on both sides, the right whale of the North Pacific, and the right whale of Greenland was one and the same animal, the inferences being that at some period of the year there must be a water communication from one to the other through the Arctic Seas. This has led to the discovery by Lieut. De Haven, U.S.N., and Capt. Penny, of a north-west passage through an open sea.

CALORIC SHIP, "ERICSSON."

WE are informed on good authority, says a correspondent of the *Journal of the Franklin Institute*, that this vessel has had removed from her the large cylinders of fourteen feet diameter, and six feet stroke, as well as the supply cylinders, eleven feet and a half diameter, air-receivers, regenerators, &c.; in fact, all of that part of the machinery peculiar to Capt. Ericsson, and patented by him in the four quarters of the world. There still remains on board the shaft-wheels and cranks, which being of the ordinary kind may yet be of service. Having virtually abandoned every principle that he claimed, and which he advocated as late as the June Number of

Appleton's Magazine, the question arises, what will he do next? He has sustained himself as the perfecter of a new motive power before the community for the last eighteen months, by the strictest secrecy as regards all practical results, and the exclusion from his ship of those capable of judging; and he now finds that those who have been termed by him, "smatterers," have (perhaps through their ignorance), been true prophets. It will be a pleasure to those foundries which were unable to make twenty feet cylinders, to be informed that Capt. Ericsson, in the new engines now going on board, has concluded to use them of about six feet diameter. It will, no doubt, be a source of regret to the late Secretary of the Navy, who advised Congress to build two ships like the *Ericsson*, to know that the two engines will not admit of those two large double pistons, which, by the reports of Capts. Sands and Ericsson, formed a peculiar feature of that ship, and ensured such regularity of motion. In the new engines now about being put in, the large cylinders have a diameter of about six feet, and the supply cylinders of a diameter of about three feet and a half. The same air is to be used at a high pressure over and over again, and is alternately heated and cooled as it passes through tubes immersed in fire (before it enters the large cylinders, and water after it leaves them). It is presumed that the new machinery will be on board in time to go to Washington before the next Congress adjourns, as it is thought that from the large number of experimental ships that have fallen into the hands of the Navy department in times past, government could not do better than make another investment, much to the relief of those unfortunate individuals who have furnished the capital for the present magnificent expedition.

PROCEEDINGS OF INSTITUTIONS.

LOWESTOFT MECHANICS' INSTITUTION.—On Tuesday evening, the Tenth anniversary of the Institution was celebrated at the Town-hall by a *conversazione*, interspersed with vocal performances by professionals from Norwich. The hall was decorated with flags lent by Messrs. Fry, Morse, and Welton. On a table in the centre of the hall were various models of steam and other boats, specimens of medicinal products of various nations, and at the end a printing-press, and on the walls and front of the platform were hung various diagrams of Stonehenge, and other monumental stones to be found in the kingdom. In the absence of D. H. Fry, Esq., the business of the evening was opened with a suitable address by Dr. Brame. Mr. W. B. Wilton addressed the audience on steamboat machinery, Mr. W. F. Bard spoke upon the medicinal specimens, Mr. Oliver on the wonders achieved by the printing-press, while his employer struck off, to the amusement of many, specimens, which were distributed among the auditory. Mr. Bly made some interesting remarks upon Stonehenge and other Druidical remains, and promised two or three lectures on the same subject. Dr. Foreman gave an account of what had been done by the Institution, what were its present and what its future prospects, and expressed a hope that ere another year had seen its round, they would have the pleasure of meeting in their own Mechanics' Hall. D. H. Fry, Esq., who entered during the evening, warmly advocated the claims of the Institution, and drew a picture of what he wished and what he hoped to see it become. The evening was unpropitious, but the receipts were very good. It is hoped that

the Institution has received an impetus which will not soon cease to be felt.

SEVENOAKS.—On Thursday, August 18th, Mr. W. Hughes, F.R.G.S., gave the third and concluding Lecture on "Physical Geography," to the members of the Literary Institution. On this occasion, Climate, and its Influence on the Vegetable and Animal Kingdoms, was principally dwelt on—the Ocean, and Volcanoes and Earthquakes, having been explained in the previous Lectures. At the conclusion, the Chairman, Mr. R. H. S. Smith, presented the thanks of the members to Mr. Hughes for his interesting and instructive series of Lectures.

TO CORRESPONDENTS.

The peeling off from the stucco on houses is sometimes caused by the frost, from the work having been badly finished: sometimes from paint having been put upon the surface before the water used in the stucco had evaporated, or the walls on which the stucco was laid were dry: sometimes from salt water, or sand containing a considerable quantity of saline matter, being used with the stucco; and in the case of Roman or Parker's cement, from the circumstance that this stone or *sepiaria* (a ferruginous limestone) contains saline matter, which is not entirely driven off in the process of calcination, and which, after the cement is used, exudes on the surface. If the wall on which this stucco is placed is in a dry situation, this efflorescence is not of long continuation, but if in a damp situation it continues to exude for many years. In dry situations, after twelve months this cement may be painted upon with safety. There are many natural cements (limestones) which are free from saline substances; and most of the artificial hydraulic cements—for example, what is called Portland cement—are entirely free from the same. How to prevent the peeling off, or the exuding of saline matter from stuccoes containing the same, when the wall is damp, is very difficult to say. When the work is well done in London it is usually coloured the first year with a wash of lime, copperas, and ochre, and the second year painted, first with a priming of red lead and linseed oil, and afterwards with strong lead paint, tinted of a buff stone colour. There are many skilful plasterers who profess to have recipes for preventing this peeling off, but if the situation be damp, their success for above one or two years is doubtful when the stucco contains salt.

MISCELLANEA.

FLAX.—A new Company has been formed in Paris for the manufacture of flax cotton upon the system of the Chevalier Claussen.

COFFEE.—In 1834 there was only one European coffee-planter in the interior of Ceylon; now there are about 300.

TEA.—The average yield of tea is about 120lbs. per acre, and the average cost of producing a pound is about 8d.

TEST FOR COPPER.—The *Technologist* gives a method for detecting the presence of copper in spirits, and freeing them from it. Olive oil, it says, is not only well known as an excellent test for indicating the presence of a salt of copper in any liquid, but it is also a means of clearing spirits from any traces of copper which may have proceeded from the vessels in which they are distilled. If for this purpose a few drops of olive oil are introduced into the spirits, and shaken, in a few minutes, as soon as it begins to separate, it will be seen to take a green hue, and absorb all the copper which may happen to be present, so that the most delicate tests cannot fail to detect any trace of the metal.

SALT EXPORTED FROM THE UNITED KINGDOM.—A return which has recently been printed shows that the quantity of salt exported during the year 1851 was 18,233,405 bushels, and the declared value was 235,849l.

IMPORTATION OF HEMP.—From a return which has just been made to Parliament, it appears that in 1851 there were 1,301,488 cwt. of hemp imported, 1,194,184 cwt. of flax and tow, and 630,471 cwt. of flax seed and linseed.

NEW PATENT PRINTING MACHINERY.—On Saturday afternoon a large number of gentlemen assembled at No. 5, Waterloo-place, to inspect some patent printing machinery, which it is proposed to carry into operation by means of a company of shareholders. The inventor is Major Beniowski. The primary feature of the scheme is the use of logotypes, the peculiarity of which is, that besides being composed of double, treble, and even quintuple combinations of letters, the character to be printed is stamped at the bottom of the type, and so presented first to the eye of the compositor; and, consequently, a person not trained in what is technically termed composing, can soon with great facility single out the letter or letters he requires. Logotypes, so far from being novel, were used in printing one newspaper, at least, towards the close of the last century. The reason assigned for their abolition was the immense space required for their proper arrangement, the frames employed being ten times as long as the ordinary existing case. To remedy this, Major Beniowski has devised what is termed "the authoritor," composed of 1,650 compartments rising above each other, and all placed within the reach of a person sitting opposite them in a chair. Here the single and combined letters are arranged in convenient alphabetical order; and, instead of being selected with the hand, are picked out with metal tweezers. Whatever difficulties may attend the practical every-day working of the machinery, there can be no doubt that the composing of the logotypes is an operation of great rapidity. It is part of the system that females and children can soon be taught to compose. On Saturday, a young lady composed five and a half lines from a newspaper, taken up at random, within three minutes, which is at the rate of 110 lines per hour—a speed far above that which is attainable under the established system, and which, if the other parts of the plan correspond with it, must have the effect of immensely reducing the cost of composition. The distribution of the type, after being used, is performed by means, first, of drawers into which it has to be dropped, and then by being slid down the composing apparatus in separate grooves. One important element of the scheme is the power which it will afford, if it can otherwise be made to work, of correcting the composed type in metal instead of proofs. In addition to the type apparatus, there is a new printing machine, the novel features of which are that the types are imposed on the interior surface of a cylinder, and therefore cannot, it is alleged, fall out by their own gravity, or be driven off by the centrifugal force; and that the feeding and receiving boards, the distributing, inking, and impression rollers, &c., are in the interior of a cylinder, and therefore the whole occupies one-third of the space that would otherwise be required. Great stress, also, is laid on the use of vulcanised India-rubber rollers, which are not affected by the temperature of the atmosphere.—*Daily News*.

A NEW MODELLING CLAY.—It is stated in *Cosmos* that M. Barreswill has prepared for the use of sculptors a new modelling clay, which does not dry but remains constantly moist. His process consists in moistening the clay not only with water, but with a concentrated solution of glycerine, a substance which does not dry.

INVENTIONS.

PROTECTING SUBMARINE TELEGRAPH WIRES.—Mr. T. Allan, of Adelphi-terrace, has taken out a patent for an improved plan of protecting submarine telegraphs, consisting of iron wires, twisted spirally round a central iron rod or core, leaving room between the spirals for the reception of the insulated telegraph wire. In a rope thus formed, the longitudinal strain and crushing effect will be borne entirely by the protecting wires, while those insulated will be fully protected from strain and injury. A considerable addition to the length necessary for the insulated wires appears to us inevitable from this twist; but we presume the specification includes the principle of laying them longitudinally round the iron core under the spiral covering wires, if found desirable.

IMPROVED PREPARATION OF ASPHALTE.—Mr. A. E. L. Bellford, of Holborn, has patented some improvements for rendering asphaltic and other bituminous substances applicable to various useful purposes. By this process they are first fused in metal cauldrons, and then passed through a sieve placed above a pair of rolls, between which the molten substance passes, which rolls are regulated according to the desired thickness of the sheets. The rolls are placed at suitable heights and distances from the winding-off or dividing rollers, around which is passed continuously either paper, canvas, or any kind of cloth or metallic fabric, which gives the rolled sheets great solidity, and a more uniform surface. These sheets may be made of any thickness required; or two or more sheets may be piled together, and again rolled, and are generally applicable to covering all kinds of buildings, the construction of pipes, coating walls, laying pavements, floorings, &c.

CHIMNEY-POT.—Mr. C. W. White, of the Commercial-road, Pimlico, has filed a specification (dated 20th inst.) for an improved chimney-pot and ventilator. The top is closed, and the smoke finds its exit at the interior spiral perforations, which perforations are covered by exterior spiral projections, or chambers, which prevent any action of currents of wind. The inventor claims for this peculiar construction the advantage of creating an upward current, or draught, rendering it very useful for ventilating purposes. The architectural effect produced by the spiral, the inventor considers, is of a pleasing character, and much superior to the many cowls and chimney-pots which disfigure the metropolis.

SHEATHING IRON SHIPS.—Mr. W. Seaton has recently patented an improvement in sheathing or covering iron ships. He proposes to construct the lower portion of the vessel, from the water-line to the keel, with an even surface, by uniting the plates of iron by a chump or butt-joint, or edge to edge, secured inside by riveting a strip of metal over the seam, or joint. He then planks this surface with thin wood-planking, which is secured to the iron vessel by countersunk rivets, or screws. Between the iron and the planking, felt may be interposed to render the whole more secure and watertight. This even surface of wood is to be sheathed with copper, Muntz's metal, or other alloy of metal, in the same manner as an ordinary wooden vessel would be sheathed. The speedy oxidation and consequent corrosion of the sides and bottoms of iron vessels would thus, the inventor says, be prevented; the ship so covered would in all respects be stronger, and the extra expense, taking into account the advantages gained, would be inconsiderable. Since wooden vessels are almost without exception sheathed with copper, and iron vessels require some covering to protect them from barnacles, oxidation, &c., the inventor claims to have discovered a great desideratum in naval economy.

IMPROVED WHIM.—Mr. J. Maynard, a miner of Klogan, in order to prevent the accidents which not unfrequently occur, both to men and horses, through the running of whims, proposes to fix a drag to the shaft of the whim, to be acted upon by a lever conveyed through a pipe or launder, under ground, to the landing brace or place, with a handle, by which, if the load runs away with the horse, or any other accident occurs, the lander may immediately stop the whim. As the driver is usually afraid to run out of the whim-round, and generally throws himself on the ground, it is suggested that another lever should be placed near the shaft of the whim, for the driver to assist the exertions of the lander.

IMPROVED REFRIGERATOR.—A model and drawing of this refrigerator by Mr. J. Williams, of Hayle, was

shown to the judges at the Exhibition of the Royal Cornwall Polytechnic Society, as applied to rapidly reduce the temperature of the wort in the process of brewing. The pipes for conveying the cold water were small and of thin tinned copper, and were fixed to a wooden frame, hinged to one side of the cooler, or "back," in order that they may be raised for the convenience of cleaning the latter, or for repairs. To ensure the exposure of every part of the cooling surface to the wort, the latter is made to flow in a contrary and zig-zag direction along the cooler, by means of cross divisions, which are alternately close at one end, and open at the other. These are also attached to the frames which carry the pipes so as to be lifted out together. An additional horizontal branch pipe is attached to the refrigerator for the purpose of emptying it before it is lifted from the cooler. By this arrangement the cold water which has been heated by the first of the wort is successively brought in contact with hotter and hotter portions of it.

IMPROVED LOCK FOR SLIDING PANELS AND DOORS.
—Mr. J. Lidstone, of Devonport, has invented a lock to be used on board ship, where sliding panels and doors are in constant requisition. The projecting part of the bolt is in the form of the letter **T**, the head of the **T** being vertical, and entering a vertical and narrow opening in a plate let into the edge of the panel. The bolt itself is cylindrical, and can be turned on its axis, so that the **T** head can assume the horizontal position, when it forms a sort of button, and allows the panels and doors to be slidden along without separating them. The key is only turned once round. The first part of the turn raises a tumbler and delivers the bolt; on further turning it, it raises another tumbler, and draws forward a flat bolt at right angles to the first, and wholly concealed in the lock. This flat bolt carries three teeth, which fit into corresponding cavities in the cylindrical bolt, and as it moves forward turns the cylindrical bolt one-fourth round, when the tumbler again falls, and retains it in this position. The entire arrangement of the lock is very simple and effective, with extremely little liability to get out of order.

PARLIAMENTARY REPORTS.

SESSIONAL PRINTED PAPERS.

Delivered on 16th, 17th, 18th, and 19th August, 1853.

- Par. No.
898. Peterborough Election Petitions—Report from Committee.
645. Calicoes, &c.—Return.
849. Omagh Nunnery School—Return.
895. Salt, &c.—Account.
934. Peterborough Election—Report from Committee.
881. Navy, Army, Commissariat, and Ordnance Services—Detailed Accounts.
870. Post-Office—Return.
885. Highways—Returns.
903. Copper, &c.—Account.
906. Railways—Return.
925. Malt—Account.
960. Army Prize-money—Account.
965. Assurance Associations—Report from Committee.
953. Liverpool Election—Minutes of Evidence.
922. Bill—Government of India (Lords' Amendments.)
815. „ —Public Libraries and Museums.
Russia—Correspondence.
China—Order in Council.
China—Papers relating to the Civil War.
Turnpike Trusts—Reports of the Secretary of State.
Court of Rome—Further Papers.
Public General Acts—Cap. 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, and 63.

Delivered on 20th August.

889. Registration of Assurances Bill—Report from Committee.
918. Quarantine (Carthagea)—Copy of a Dispatch.
931. General Board of Health—Account.

PATENT LAW AMENDMENT ACT, 1852.

APPLICATIONS FOR PATENTS AND PROTECTION ALLOWED.

From Gazette, 19th August, 1853.

Dated 26th May, 1853.

1290. E. White, Ipswich—Supplying water to towns.

Dated 31st May.

1337. H. Hughes and W. T. Denham, Cottage-place, City road—Pianofortes.

Dated 13th July.

1667. A. Morton, Cockerill-buildings, Bartholomew-close—Manufacture of paints, &c.

Dated 15th July.

1697. W. E. Newton, 66, Chancery-lane—Apparatus for digging, &c. (A communication.)

Dated 18th July.

1710. S. Perkes, 1, Walbrook—Portable metallic folding bedsteads, &c.

Dated 21st July.

1723. J. Lilley, Thingwall, Woodchurch, Cheshire—Separating matter in stalks and leaves of plantain, &c., for making ropes, &c.

Dated 25th July.

1750. Professor C. F. Spieker, New York—Generating and fixing ammonia.

Dated 2nd August.

1801. J. Griffiths, Stepaside Saunderfoot, Tenby—Steam-engines.

1802. W. L. Anderson, Norwood—Propeller.

1805. A. J. Quinche, 16, Castle-street, Holborn—Measuring distances travelled by vehicles.

1808. M. E. Boura, Crayford, Kent—Supplying ships with water, air, or ballast.

1809. G. Richardson, Gutter-lane, Cheapside—Stoves for warming.

Dated 3rd August.

1810. T. Atkins, Oxford—Transmitting power to agricultural instruments.

1811. J. C. Daniell, Bath—Preparing food and litter for cattle.

1812. J. Slack, Manchester—Reeds for looms.

1813. W. E. Newton, 66, Chancery-lane—Machinery for cutting cardboard, &c. (A communication.)

1815. W. S. Roden and W. Thomas, Ebbw-vale Iron-works, Monmouthshire—Rolling metals.

1816. J. Macintosh, Pall-mall—Bridges, viaducts, &c.

1817. A. M. Servan, 8, Philpot-lane, London—Soap.

1818. J. Billings, 8, Luton-place, George-street, Greenwich—Roofing buildings.

1819. J. Cumming, Glasgow—Printing shawls, &c.

Dated 4th August.

1820. W. Hickson, Carlisle—Canal and river navigation in vessels, and propelling.

1821. C. H. Snell, Triangle, Hackney—Soap.

1822. G. Armitage, Bradford—Presses.

1823. C. B. Clough, Tyddyn, Flintshire—Machinery for washing, &c., woven fabrics, &c., felts, &c., corn roots, &c.

1824. R. B. Roden, Abersychan Iron-works, Newport, Monmouthshire—Rolling iron, &c.

1825. T. Moss, 24, Gainford-street, Islington—Printing bank-notes, &c.

1826. B. L. F. X. Fléchelle, Paris—Carrying, bedding, and bathing sick persons.

1827. G. F. Wilson, Belmont, Vauxhall, and A. J. Austen, Trinity-place, Wandsworth-road—Apparatus for making mould candles.

Dated 5th August.

1829. W. Smith and T. Phillips, Snow-hill—Boiler.

1830. R. Peters, Southwark—Apparatus for ascertaining distance traversed by cabs, &c.

1832. E. T. Bellhouse, Eagle Foundry, Manchester—Fireproof structures.

1833. W. and J. Garforth, Dukinfield, Chester—Machinery for making bricks.

1834. R. Hunt, 18, Cottage-place, Greenwich—Tile, and making same.

1835. J. Lee Norton, 8, Holland-street, Blackfriars-road—Obtaining wool from fabrics to be used again.

1836. W. Newton, 66, Chancery-lane—Coating cast-iron with other metals, &c. (A communication.)

Dated 6th August.

1837. M. Z. Just, Manchester—Hulling rice. (A communication.)

1838. J. Hughes, 31, Great George-street, Westminster—Building structures under water or under ground.

1839. J. Martin, High-street, Marylebone—Shade for gas and other burners.

1840. A. E. L. Bellford, 16, Castle-street, Holborn—Combination of glass and iron for floors, roofs, windows, pavements, &c. (A communication.)

1841. R. B. Martin, Suffolk-street, Haymarket—Plate-warmer.
 1843. R. Morrison, Newcastle-upon-Tyne—Apparatus for forging, shaping, and crushing iron, &c., and driving piles.
 1844. P. A. le Comte de Fontainemoreau, 4, South-street, Finsbury—Transmitting power. (A communication.)
 1815. J. Green, 10, Queenhithe—Printing machinery. (A communication.)

Dated 8th August.

1846. R. Christy and J. Knowles, Fairfield, Manchester—Terry cloth, and machinery for same.
 1817. W. E. Newton, 66, Chancery-lane—Horse-shoes. (A communication.)
 1818. W. Hickson, Carlisle—Heat for baking and drying, and in generating steam.
 1819. M. Poole, Avenue-road, Regent's-park—Regulating flow and pressure of gas and other fluids. (A communication.)

Dated 9th August.

1850. T. Y. Hall, Newcastle-upon-Tyne—Combining glass with other materials.
 1852. W. Rowan, Belfast—Looms and apparatus connected therewith.
 1854. L. H. Bruck, Mark-lane—Construction of tunnels, sewers, drains, &c., for hydraulic or other purposes.

Dated 10th August.

1856. H. Peters, Birmingham—Pens and penholders.
 1858. J. Burden, Stirling—Cock or tap.
 1860. J. P. A. Galibert, M.D., Paris, and 4, Trafalgar-square—Domestic telegraph.

Dated 11th August.

1866. J. Rushbury, Wolverhampton—Lock.
 1868. T. Dewsnup, Manchester—Motive-power.
 1872. H. M. Naylor, 111, Montpelier-row, Bloomsbury, Birmingham—Affixing postage and other stamps.
 1874. G. Deards, Harlow—Lamps.

WEEKLY LIST OF PATENTS SEALED.

Sealed 19th August, 1853.

430. James Chadnor White, of Liverpool-street—Improvements in fastenings for harness, and which are also applicable to other like purposes.
 441. James Mash, of Highfield-terrace, Kentish-town, and Joseph Sharp Bailey, of Keighley—Improvements in weaving machinery employed in the manufacture of textile fabrics, and in the manufacture of such fabrics.
 415. Thomas Bell, of Bristol, and Richard Chimes, of Rotherham—Improvements in valves, applicable to the receiving and discharging of water or other fluids.
 463. John Green, of York-buildings, New-road—Invention which he designates "Green's Economical Self-basting Cooking Apparatus."
 622. Peter Armand le Comte de Fontainemoreau, of 4, South-street, Finsbury—Improved apparatus for filtering liquids. (A communication.)
 646. Joseph Maudslay, of Lambeth—Improvements in screw-propellers for ships and other vessels.
 719. Charles Augustus Holm, of Cecil-street, Strand—Improvements in propelling vessels.
 831. John Grist, of the New North-road—Improvements in machinery for the manufacture of casks, barrels, and other similar vessels.
 915. Jean Baptiste Maniquet, of Paris—Improvements in machinery or apparatus for winding, cleaning, doubling, twisting, and spinning silk, cotton, wool, flax, hemp, and other filamentous materials.
 1054. John Balmforth, William Balmforth, and Thomas Balmforth, all of Clayton, Lancashire—Improvements in steam hammers.
 1058. John Filmore Kingston, of Carrol, Maryland—Improvements in reaping and mowing machinery.
 1261. George Marriott, of Hull—Improvements in the manufacture of fire-lighters.
 1321. Edward Duclou de Boussois, of Paris—Improvements in preventing incrustation of steam-boilers.
 1364. James Mayelston, of Elloughton, Yorkshire—Improvements in the manufacture and refining of sugar.
 1367. Thomas Barnabas Daft, of Lezange-lodge, Isle of Man—Improvements in inkstands.

1424. Christopher Nickels, of Albany-road, Surrey, and James Hobson, of Leicester—Improvements in the manufacture of carpets and other piled fabrics.

1441. Thomas Richardson, of Newcastle-on-Tyne—Improvements in the manufacture of certain salts of magnesia and a red colouring matter.

1442. Joseph Leon Talabot, of Chaussée d'Antin, Paris, and John Davie Morris Stirling, of the Larches, near Birmingham—Improvements in the manufacture of iron.

1453. James Dilkes and Edward Turner, of Leicester—Improvements in door-springs.

1469. Clinton Roosevelt, of New York—Invention for reducing the friction of the journals of railway and other carriages, which is also applicable to the journals of machinery.

1471. Benjamin Finch, of Dublin—Improvements in apparatus for supplying water to steam-boilers.

1483. Henry Bessemer, of St. Pancras-road—Improvements in the manufacture of waterproof or partially waterproof fabrics.

1490. James Shanks, of St. Helen's, Lancashire—Improvements in the manufacture of alkali from common salt.

1537. George Sands Sidney, of Brixton-road—Improvements in jugs or vessels for containing liquids.

1566. Peter Armand le Comte de Fontainemoreau, of 4, South-street, Finsbury—Improvements in the construction of furnaces. (A communication.)

1568. Robert Moore Sievier, of Louviers, France—Improvements in the manufacture of piled fabrics, and in machinery for effecting the same.

Sealed 20th August.

442. William Pidding, of the Strand—Improvements in coverings for the feet of bipeds or quadrupeds.

443. Richard Farrant, of Picnic—An improved chimney-pot.

444. Ezra Miles, of Soubury—Improvements in railway breaks.

452. George Winiwarer, of Red Lion-square—Improvements in the manufacture of fire-arms.

Sealed 23rd August.

478. John Palmer De la Fons, of Carlton-hill, St. John's-wood—Improvements in applying skids or drags to omnibuses.

480. Henry Martyn Nicholls, of Gower-place—Improvements in emission or reaction engines.

482. John George Taylor, of King-street, Cheapside—Improvements in ornamental fastenings for dress.

516. Laurence Hill, junior, of Port Glasgow—Improvements in the production of motive power. (A communication.)

579. Thomas James Perry, of the Lozells, Birmingham—A new or improved method of constructing cornice-poles and picture and curtain-rods, and other rods from which articles are suspended.

656. Edward Nickels, of the Albany-road, Camberwell—Improvements in preparing lubricating matters. (A communication.)

657. John Livesey, of New Lenton—Improvements in pile and looped fabrics, in cutting and finishing such fabrics, and in the machinery employed therein.

737. Thomas James Perry, of the Lozells, Birmingham—Improvements in printing.

1240. John Hippisley, of Stoneaton—Improvements in steam-engines suitable for agricultural purposes, and to locomotives on common roads.

1360. William Edward Newton, of 66, Chancery-lane—Improvements in the manufacture of soles for boots, shoes, and other coverings for the feet. (A communication.)

1422. Richard Archibald Brooman, of Fleet-street—Improvements in the manufacture of paper. (A communication.)

1601. George Mackay, of Buckingham-street, Strand—Improvements in the manufacture of glass. (A communication.)

Sealed 24th August.

465. Henry Walmsley, of Failsforth, near Manchester, and Thomas Critchley, of the same place—Improvements in machinery or apparatus for retarding or stopping railway trains, which machinery or apparatus is also applicable as a signal or communication from one part of a train to the other.

WEEKLY LIST OF DESIGNS FOR ARTICLES OF UTILITY REGISTERED.

Date of Registration.	No. in the Register.	Title.	Proprietor's Name.	Address.
August 18	3499	Victoria Copper Pouch, Advertiser, and Sample-bag.	Samuel Bremner	Carlisle.
" 19	3500	A Combined Refrigerator and Filter for Icing Filtered Water.	Thomas D. Mills	1, Vernon-street, Vernon-square, Pentonville.
" 23	3501	The Convenient Cobbler; or, Travellers' Companion.	Charles Palmer	1, Church-row, Islington.